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Species Conservation Guidelines

South Florida

Sand Skink and Bluetail Mole Skink

The Species Conservation Guidelines for the sand skink (*Neoseps reynoldsi)* and bluetail mole skink (*Eumeces egregius lividus*) (skinks) provide a tool to determine if a project, *i.e.*, a Federal permit, a Federal construction project, or other such action, may adversely affect skinks. Here we describe what actions might have a detrimental impact on skinks and how these effects can be avoided or minimized.

Life History

The Fish and Wildlife Service (Service) federally listed the sand skink and the bluetail mole skink as threatened in 1987 due to modification and destruction of xeric upland communities in central Florida. Service (1999) can be consulted for more information on species biology, habitat needs, threats to survival, recovery criteria, and goals.

Habitat

The bluetail mole skink occupies habitat similar to that of the sand skink, however, these species do not compete because of resource partitioning. Sand skinks are primarily fossorial and take prey below the surface, whereas the bluetail mole skink hunts at the surface and consumes mostly terrestrial arthropods (Smith 1977).

Both skinks are most commonly associated with habitat dominated by xeric vegetation, such as oak-dominated scrub, turkey oak barrens, high pine, and xeric hammocks. Skinks typically occur in habitats that contain a mosaic of open sandy patches interspersed with forbs, shrubs, and trees. Although sand skink tracks are most typically observed in open sandy areas, both species utilize a variety of other micro-habitats within xeric vegetative communities. Areas containing extensive rooted vegetation within this matrix may preclude sand skink movement and are less likely to be used by skinks. They appear most abundant in the ecotone between areas with abundant leaf litter and vegetative cover and adjacent open sands. Recent surveys have noted the occurrence of skinks in converted lands, such as citrus groves and residential developments. Suitable habitat for skinks includes native xeric habitats, remnant xeric parcels in residential communities, and active or inactive citrus groves. Typical upland habitat for these skinks consists of sand pine (*Pinus clausa*)-rosemary (*Ceratiola ericoides*) scrub or longleaf pine (*Pinus palustris*)-turkey oak (*Quercus laevis*) association. Bluetail mole skinks are typically found under leaves, logs, palmetto fronds, and other ground debris (Christman 1992). Both skinks only occur at elevations above 25 m (82 ft) (P. Moler, Florida Fish and Wildlife Conservation

Commission, email correspondence, May 31, 2003).

Soil type is important in determining suitable habitat for skinks as they prefer sandy well drained soils. These include the Apopka, Aradondo, Archbold, Astatula, Candler, Daytona, Duette, Florahome, Gainesville, Hague, Kendrick, Lake, Millhopper, Orsino, Paola, Pomello, Satellite, St. Lucie, Tavares, and Zuber soil series. No critical habitat has been designated for either species.

Distribution

Due to their small size and semi-fossorial to fossorial habits, both species are difficult to detect. This fact is evidenced by the paucity of locality records for these species. As of 2002, the Florida Natural Areas Inventory database indicated bluetail mole skinks were known from 38 locations while sand skinks were recorded at 129 sites. However, experienced herpetologists and researchers acknowledge that skinks are more widely distributed than the locality records indicate and that if searched sufficiently, most suitable habitat would yield additional records for these species.

Suitable bluetail mole skink habitat is restricted to xeric uplands within the Lake Wales Ridge in Highlands, Osceola, and Polk Counties. Sand skink habitat occurs within the Lake Wales Ridge, but also is found on the Winter Haven Ridge in Polk County and the Mount Dora Ridge in Lake, Marion, Orange, and Putnam Counties. The south Florida consultation area also includes small portions of Hardee and Glades Counties where elevation and habitat may be suitable (Fig. 1).

Determination

The skinks SLOPES flowchart can be found in Figure 2. The first step requires project-specific information that includes a project description, habitat maps, and project location. On the project maps, determine the boundaries of the project. Next map habitat types present on the property using a standard classification scheme (preferably FLUCCS codes) (see SLOPES Introduction for more details).

Next review the consultation area map (Fig. 1). If the project is outside the consultation area then no effect from the project on skinks is anticipated and other Federal action can proceed. Keep in mind, if skinks are known from the property or are found on site then appropriate conservation measures should be implemented. If the project is inside the consultation area then check for suitable habitat (scrub [FLUCCS codes 412, 413, and 421] with exposed sand and above 25 m (82 ft) elevation). Suitable habitat for skinks may include remnant xeric parcels in residential communities, active, and inactive citrus groves. Therefore, site-specific assessments of parcels proposed for modification are necessary to determine if there will be adverse effects to skinks. If no suitable habitat is present, then no effect from the project on skinks is anticipated.

If suitable habitat (both elevation and type) is present, two options are available. **Option a** provides for the use of a survey of the property to determine the presence or presumed absence of skinks in suitable habitat. **Option b** assumes that suitable habitat supports skinks.

A survey can be used to determine the presence or presumed absence of skinks. Only sand skinks leave obvious signs of their presence. As such they are used as indicators of skink presence as they overlap in distribution with bluetail mole skinks. See Appendix A for details on how to survey for skinks. The skink survey protocol is the minimum level of effort the Service believes is necessary to determine the presumed absence of skinks from a project area.

If a survey does not detect skinks, then no effect from the project on skinks is anticipated and other Federal action can proceed. Survey results should be forwarded to the Service to help us improve our knowledge of the species and update our database. If skinks are found on the property or are assumed present then the project may affect the skinks and conservation measures should be implemented to minimize adverse effects.

Conservation Measures

Service (1999) identifies lack of scrub management and conversion of xeric habitat to other uses as the principle factors in the vulnerability of these species. In most situations, unmanaged scrub tends to become dense and tall, conditions that are not favorable to many scrub-dependent species. Management of overgrown scrub includes thinning, burning, mowing, or other techniques to reduce vegetative density.

The Service recommends that occupied habitat be avoided and preserved. A first measure is to modify the project footprint to avoid direct impacts to skink habitat. The habitat should be designated as an environmentally sensitive area and set aside by deed restriction, easement, or protective covenant. If habitat is set aside then a habitat management plan is also recommended. For small projects less than 2 ha (5 acres) a management plan is not needed. The incorporation of these recommendations into the project design and documented in the habitat management plan could result in a project that is not likely to adversely affect the skinks.

On-site habitat enhancement is recommended in situations where a project proposes to impact occupied skink habitat and surveys have noted that the habitat has been physically altered by exotic species invasion, lack of fire, or other anthropogenic actions. These alterations have produced habitat conditions that have resulted in marginally suitable habitat for the survival and propagation of skinks. Impacts can be minimized by adjusting the project footprint to avoid a substantial portion of the habitat and including on-site habitat enhancements that provide habitat quality improvements that balance losses of small amounts of marginally suitable habitat. The incorporation of these recommendations into the project and documented in a habitat management plan could result in a project not likely to adversely affect the skinks. The habitat management plan, in this scenario, also needs a monitoring program to document the success of the enhancement actions.

When skinks are present and take is likely, appropriate conservation measures should be implemented. Both Federal and nonfederal projects through section 10 of the Endangered Species Act require an incidental take permit when take is likely. See the Service's web site at http://endangered.fws.gov/hcp/HCP_Incidental_Take.pdf or contact the South Florida Ecological Services Office at 772-562-3909 for more information on the nonfederal project process.

Measures recommended to minimize adverse effects from anticipated take are primarily acquisition and habitat management. Compensation for habitat loss is recommended in this situation. The Service prefers that nearby occupied habitat be acquired and managed. A second less desirable option is acquisition of unoccupied habitat. This requires a restoration component, as well. The restoration component for xeric habitats generally includes exotic species removal, controlled burns, and creation of patchy, sandy open areas. These measures further the Service's goals for conservation and recovery of the species. The recovery goals are best achieved through efforts to expand the boundaries of existing preserves or to protect and manage occupied and unoccupied habitats that are contiguous to the preserved lands.

Reports

A habitat management plan is necessary when proposed actions may affect skinks. In general, the plan includes a detailed description of how the habitat will be managed, what steps will be taken to enhance or improve the habitat, and how will it be maintained over time. The plan should also include any survey reports and any land preservation covenants. If habitat enhancements are proposed, the management plan needs to include a habitat monitoring component. The habitat management and monitoring plan can be incorporated into the consultation initiation package. Refer to the Service (2004) for more details on what to include in the initiation package.

Where monitoring is incorporated into the habitat management plan, a coverboard survey should be carried out once per year for five years during the appropriate period (see Appendix A for survey protocol). A survey report should be sent to the Skink Lead Biologist, South Florida Ecological Services Office, 1339 20th Street, Vero Beach, Florida 32960.

Literature Cited

Christman, S.P. 1992. Bluetail mole skink. Pages 117-122 in P.E. Moler, editor. Rare and Endangered Biota of Florida. Vol. 3. Amphibians and Reptiles. University Press of Florida, Gainesville, Florida.

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U.S. Fish and Wildlife Service (Service). 1999. South Florida multi-species recovery plan. Atlanta, Georgia. http://verobeach.fws.gov/Programs/Recovery/vbms5.html

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GIS Data

Skinks_CA	Consultation Area for skinks

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APPENDIX A

Sand and Bluetail Mole Skinks

Survey Protocol
South Florida